

**Applied Quaternary geology and till geochemistry of the Loch Lomond Area,
Cape Breton Island, Nova Scotia: implications for mineral exploration**

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Southeastern Cape Breton is host to several former industrial minerals and base metals mines. These deposits were discovered by traditional prospecting methods; however, subsequent exploration has been hampered by thick glacial overburden, limited outcrop and a complex glacial history. Given these conditions, a detailed understanding of the glacial history of the study area is required in order to properly interpret till geochemistry. Three distinct tills were identified in the study area. The lowermost gray till is fine-grained, compact and contains few clasts. It is sparsely distributed and is usually found in local depressions. The middle red silty till contains some exotic clasts but with local representation; the upper brown sandy till is widely distributed over the study area and contains abundant angular local clasts. Pebble lithologies within the upper two tills suggest that these tills represent, respectively: i) a regional glacial advance and ii) a latter local glacial advance. Large scalloped ridges up to 50 m high dominate the landscape in the southern portion of the study area. The ridges are composed primarily of the upper sandy till and

are usually bedrock cored; inter-ridge areas are overlain by post-glacial organic deposits and occasionally late-glacial outwash sand and gravel.

Till samples were collected at reconnaissance scale (3-5 km spacing) to determine regional background levels of base and precious metals and to identify anomalous areas that may indicate local mineralization. Preliminary data indicate that elevated Pb and Sr concentrations occur in local till samples near known deposits, the distance of dispersal is less than 4 km. Cu and Ba values, closely associated in some deposits, exhibit an easterly regional expression. This may indicate either remobilization of regional tills or additional occurrences of Cu-Ba mineralization. Background Cu values are also prevalent in the southern half of the project area, possibly reflecting dispersal of sulphide occurrences from the Stirling Group. Ni values are widespread in the southern half and likely represent the westerly regional dispersion of the St. Peter's gabbro.